which so-called bacteriological research opens up to those who, incapable of doing real pathological or physiological work, have leisure to practise bacteriology as a "fireside" game.

In conclusion, a word in praise of the translator and editor: he has done his work excellently, so well, in fact, that one cannot help regretting that he used his gifts and expended his labours on a book hardly worthy of so much conscientious energy and patience. The translation is better than the original in arrangement, type and general "get up." Since it is pleasing to most to possess a nice book, and one which is at the same time instructive, in spite of some remarks which may appear severer than they are meant to be, we may recommend it safely as an addition to the student's library.

A. A. KANTHACK.

THE NATURAL HISTORY OF AQUATIC INSECTS.

The Natural History of Aquatic Insects. By Prof. L. C. Miall, F.R.S. (London: Macmillan and Co., 1895.)

PERHAPS no country possesses so many amateur naturalists as England, at least in proportion to its population, and it is not without significance in this direction that many of our best professional men of science have not thought it undignified to furnish sound information on their special subjects in a popular and yet accurate manner. The present work is a good example of this, and Prof. Miall deserves praise for the admirable account he has put together of the insect inhabitants of our lakes, ponds, and watercourses.

Of course it has not been without forerunners. One of the last works of that well-known writer on popular science, the late Rev. J. G. Wood, was entitled "The Brook and its Banks," and covered much the same ground; but one may say, without any disparagement, that his book was more picturesque or anecdotal natural history than strictly scientific.

Again, Prof. Miall, like every subsequent writer on entomological subjects, is greatly indebted to the laborious researches of Swammerdam, Réaumur, Lyonnet, and others of the early naturalists, but in every case this is freely acknowledged, and he adduces their works as models of patient investigation on the living animal, particularly worthy of emulation at the present time, when attention is almost exclusively paid to phylogeny and classification, to the neglect of the actual life history, where so much still remains to be discovered. Some essential matters are briefly treated in an introductory chapter, such as the equilibrium of aquatic insects, the tension of the surface film of water and its effect on small objects, and also the question of the original habitat of insects, whether terrestrial or aquatic, which Prof. Miall confidently decides as the former, mainly from the universal presence of tracheæ and functionally active spiracles even in purely aquatic insects, showing that such as are fitted for breathing only dissolved air are those that deviate from the general and primitive rule. The chief aquatic Coleoptera are taken first, and certain curious structures in the larva and imago of several families somewhat fully described. Among these we may mention the mouth organs of the larva of Dytiscus, which have been a subject of controversy from the time of Swammerdam and De Geer up to Meinert, Schiödte and Burgess, whose description has been verified by Prof. Miall, and also the well-known tarsal clasping suckers of the adult male, the real structure and action of which was first pointed out by Lowne. The method of respiration in the adult Hydrophilus is well explained, and the extraordinary arrangement for obtaining air from cavities in submerged roots adopted by the larva of Donacia, as discovered by Siebold. Flies with aquatic larva receive considerable attention, no less than 122 pages being devoted to these extremely interesting creatures, which from their transparence, in many cases, have long been favourite objects with microscopists. The development of the Gnat, Chironomus, Simulium, Eristalis, and numerous others is fully gone into, and the amateur naturalist will find plenty of occupation, and derive no little benefit, by following out their structure with this book as his guide. There is a short account of that very beautiful aquatic hymenopterous insect Polynema, which, according to Ganin, deposits its eggs in the eggs of a Dragon-fly; and another form, Agriotypus, said to be parasitic on a Caddis-worm. Caddis-flies (Trichoptera), Sialis, the alder-fly of anglers, the stone-flies, may-flies, dragon-flies, pond-skaters, water-boatmen, and all the rest of the host of insects which pass a large part of their existence in the water, are dealt with in due order, and the descriptions are frequently supplemented with bibliographies, which will be useful to those who require further information on special points. A word must be said for the illustrations, which in large part have been drawn by Mr. A. R. Hammond for this work; they are extremely clear and well executed—quite a relief, indeed, from the old cliches usually considered good enough by publishers to adorn a work of this kind. Altogether, the "Natural History of Aquatic Insects" is a very good and useful specimen of its class.

OUR BOOK SHELF.

The Royal Natural History. Edited by Richard Lydekker, F.R.S., &c. Volume iii. (London: Warne, 1895.)

THE third volume of this excellent "Natural History" finishes the mammals, and commences the birds.

Among the former the Cetaceans, the Rodents, the Edentates with the pouched mammals, and the Monotremes are described at appropriate length. The information is generally up to date, and the illustrations are good. To the notices of the occurrence of Sowerby's whale on the coasts of England and Scotland, may be added that of its being captured some years ago in Brandon Bay, Kerry, the head of the specimen being in the Dublin Museum. The immense group of the Rodents is judiciously treated, most of the more important facts of their history being given. Only six pages are devoted to the egg-laying mammals, and there is no figure of the duckbill's egg.

The chapters on the perching birds and Picariæ are contributed by Mr. H. A. Macpherson and Dr. Bowdler Sharpe. "The number of the existing species of birds being in all probability considerably over ten thousand," the authors are obliged to treat of them even in a more condensed form than were the mammals; still the order of Passeres, which includes by far the majority of known birds, is fairly treated, and most of the well-known or interesting birds are alluded to. Dr. Sharpe confesses

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his inability to give a diagnosis of the Picariæ, that is in the logical sense, but claims that the group as selected by him possess "certain common features not found among the Passeres." In the last chapter in this volume, he treats of the Jacamars to the Toucans.

Cours Elémentaire d'Électricité. By M. B. Brunhes. Pp. 265. (Paris: Gauthier-Villars et Fils, 1895.)

THE experimental laws and general principles belonging to the study of technical electricity are set forth in this book in an elementary, but strictly scientific, manner. The book reproduces the author's first-year course of theoretical electricity at the Institut industriel du Nord de la France, and its contents furnish just the kind of foundation needed by students of electrical engineering. In several respects, the treatment differs from that generally followed in text-books; hydrodynamic analogues are entirely omitted, and the word potential is not employed, voltage, or E.M.F. between two points, being used to express potential difference.

Off the Mill: Some Occasional Papers. By G. F. Browne, B.D., D.C.L., Bishop of Stepney. Pp. 271. (London: Smith, Elder, and Co., 1895.)

ALPINE climbers, and others who find delight in mountain-peaks and glaciers, may like to read the papers on Alpine subjects reprinted in this volume. The papers originally appeared thirty years ago, and they offer to the present generation of mountaineers an interesting picture of the way in which climbs were then made. The ice-caves in the neighbourhood of Annecy form the subject of one of the papers appealing to scientific readers.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

A Cyclonic Indraught at the Top of an Anticyclone.

BETWEEN June 7 and 12 an anticyclone, with maximum pressure of 30·20 to 30·30 inches, passed slowly from the north-west across southern New England. The isobars formed well-defined ovals, with their longer axes running from south-west to north-east. It was difficult to locate the centre of the anticyclone because the isobars were broken on the side toward the ocean; but, by drawing a line through the stations showing the maximum pressure, the crest or ridge of the anticyclone could be easily located up to the 11th, after which it passed off the coast and its position became somewhat uncertain, although the pressure continued above normal over southern New England until the night of the 12th.

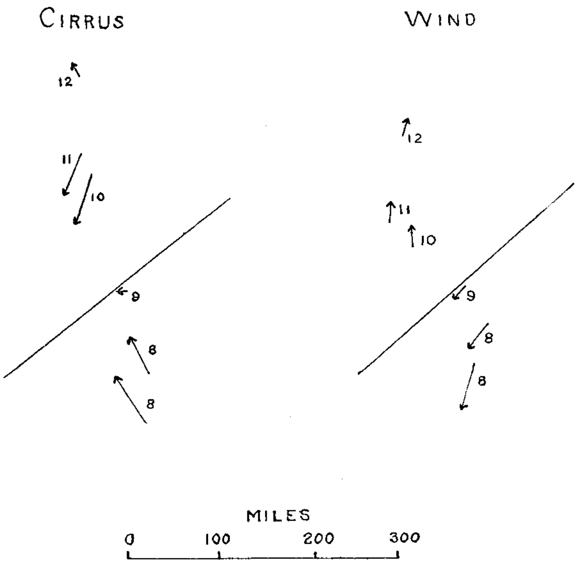
The interest attaching to the anticyclone lies in the fact that cirrus observations obtained on both sides of the line of maximum pressure indicate an indraught at the top of the anticyclone of the same nature as that observed at the bottom of cyclones.

The anticyclone passed nearly centrally over the Blue Hill Meteorological Observatory. As it approached from the north-west, the cirrus clouds on the 8th were observed moving from the south-south-east. As the line of maximum pressure passed over the observatory on the 9th, the cirrus movement shifted to the north-east, from which direction it was observed on the 10th and 11th. This change corresponds almost exactly with what would be observed in the surface wind should a trough of low pressure pass over Blue Hill from the same direction. On the 12th the cirrus shifted to south, and on the 13th to the west, with the approach of a cyclone from that direction.

The direction of cirrus movement and the mean direction of the wind is recorded at the observatory in degrees of azimuth beginning with the south point. The first is measured with a nephoscope, and the second recorded by a Draper anemoscope. The following table gives the cirrus and corresponding wind observations between the 8th and 10th, no cirrus observations being obtained on the 7th. The velocities of the cirrus were obtained by multiplying the observed relative velocities by a factor to reduce to absolute velocities. This factor was determined from direct measurements of cloud heights and velocities carried on for some time at this observatory. The last column in the table contains the directions in degrees of azimuth of the line of maximum pressure in the anticyclone, taken from the maps of the United States Weather Bureau.

	Cirrus.		Wind.		
	Dir. from.	Veloc. Miles.	Dir. from.	Veloc. Miles.	Line of max. press.
June 8, 8 a.m.	329°	48	203°	29	50°
,, 8, 8 p.m.	320	34	225	23	45
,, 9, 8 a.m.	243	6	233	18	47
,, 10, 5 p.m.	213	34	13	12	60
,, 11, 2 p.m.	245	34	21	14	70
,, 12, 8 a.m.	340 ?	16 ?	47	13	?
,, 12, 5 p.m.	341	18	8	22	?

The changes in the direction of the cirrus and of the surface wind, as related to the line of maximum pressure, is shown graphically in the accompanying diagram. The line of maximum pressure is indicated in each case by the long slanting line. The arrows fly with the cirrus and with the wind, and the length of the arrows indicate the velocity, though on a different scale in the two cases. The small figures near the arrows give the dates of observation.



Repeated observations of this kind, here and elsewhere, ought to throw some light on the causes of cyclones and anticyclones. If an indraught prevails at the top of the anticyclone of the same nature as the indraught at the earth's surface in a cyclone, it seems difficult to avoid the conclusion that there is an area of low pressure in the upper air above anticyclones, notwithstanding the fact that studies of mountain observations by Hann and others lead to an opposite conclusion. In the present case the inward gradient above appears not to have extended entirely to the outer limit of the anticyclone as indicated by the observations on the 12th.

Direct observations of the anticyclonic inflow must, however, be rare: first, because of the infrequency of cirrus in the proper positions, and the general absence of exact methods of measuring the slow motions observed; second, because there is usually a strong eastward drift in the upper air, which greatly interferes with the anticyclonic circulation, and generally overrides it, so that it only becomes strongly marked under stagnant conditions of the general atmosphere; third, the upper air isobars are usually distorted by strong contrasts of temperature in the area of the anticyclone. But notwithstanding these drawbacks, I am confident that with the increasing attention given to cloud observations, cases like the present will be frequently

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